

**REMARKS**

Claim 6 has been amended to more clearly claim Applicants' invention. Since the language included in amended claim 6 is the same as used in original claim 5, from which claim 6 originally depended, it will be understood that claim 6 has not been amended for reasons related to the statutory requirements for a patent and its scope has not been narrowed by this amendment. No new matter has been added. Claims 1-4, 6 and 8-9 are now pending. The claims as amended are included herewith in Appendix A.

Claim 6 was rejected under 37 C.F.R. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is now moot. This claim is now allowable since no other rejections of claim 6 are pending.

Claims 1-4 and 8-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bonfield et al., U.S. Patent No. 5,728,753 in view of Shimono et al., U.S. Patent No. 5,766,611. Applicants respectfully traverse this rejection.

The present invention concerns a novel method for treating inflammation. More specifically, the present invention concerns the treatment of inflammation with bioactive glass. Surprisingly, Applicants have found that bioactive glasses are useful in treating inflammation. While not being bound to any particular theory or mechanism, the bioactive glass may act as an absorbent of several inflammatory cytokines and thus act to shunt the overall inflammatory response. Evidence also suggests that the reactivity of the bioactive glass releases ions into the extracellular environment which increases the extracellular osmotic pressure. This may reduce epithelial cell swelling and thus help prevent necrosis in the area.

Claim 1 defines a method of treating inflammatory symptoms related to skin disorders, other than wounds, in a mammal, comprising topical application to the site of the inflammatory skin disorder an inflammation treating amount of non-interlinked, particulate bioactive glass the bioactive glass having the following compositional weight percentages:

|                               |       |
|-------------------------------|-------|
| SiO <sub>2</sub>              | 40-86 |
| CaO                           | 10-46 |
| Na <sub>2</sub> O             | 0-35  |
| P <sub>2</sub> O <sub>5</sub> | 2-15  |
| CaF <sub>2</sub>              | 0-25  |
| B <sub>2</sub> O <sub>3</sub> | 0-10  |
| K <sub>2</sub> O              | 0-8   |
| MgO                           | 0-5.  |

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *MPEP* § 2142; *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Office Action of June 23, 1998, originally set forth the rejection over Bonfield et al. and Shimono et al. as follows:

The difference between the claimed invention and the cited references is that the references do not expressly disclose the combined use of invention bioactive glass with topical medicinal carrier and additional therapeutic agents for treating inflammatory symptoms related to skin disorders other than

wounds. However, the bioactive glass of the invention are known to elicit beneficial physiological responses to soft tissues such as the skin, and to include further agents for delivering additional active agents or skin compatibility adjuvant purposes would have been well within the skill of the ordinary skilled artisan. Therefore, the claimed invention, as a whole, would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, because every element of the invention has been collectively taught by the combined teachings of the references.

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The pending Office Action indicates that applicants' previous responses argue as if the claims do not read on incorporation of other anti-inflammatory agents, but that claim 4 shows that claim 1 is readable on incorporation of anti-inflammatory agents. *See, page 3.*

The first requirement in a *prima facie* case is the suggestion or motivation to modify the reference or to combine reference teachings to derive the claimed invention. Here, the claimed invention is a method of treating inflammatory symptoms related to skin disorders, other than wounds, in a mammal, comprising topical application to the site of the inflammatory skin disorder of an inflammation treating amount of non-interlinked, particulate bioactive glass. Bonfield et al. is directed to the use of bioactive composite material in the repair of hard and soft tissue. The treatment of inflammatory symptoms is not mentioned or suggested in that patent. Shimono et al. provides cosmetic products with antimicrobial ions in a soluble glass. This patent does not suggest or discuss the treatment of inflammatory symptoms and relates to a completely different problem than Bonfield et al. Since neither of the cited patents even discuss the ailment treated by the claimed method, neither of these references can provide the suggestion or motivation to modify the references to obtain the claimed invention.

According to the Office Actions, as cited above, the claimed invention is obvious because claim 1 does not *exclude* the use of other anti-inflammatory agents in with the

bioglass. Applicants respectfully submit that, even if this is the case, the cited art does not provide the necessary suggestion to use *non-interlinked, particulate bioactive glass* in a method for the treatment of inflammation since neither cited patent even mentions such condition. Thus, even if an anti-inflammatory agent is present as set forth in claim 4, the invention of using *bioglass as claimed in an inflammation treating amount* to treat inflammatory symptoms would not have been obvious from the cited art since there is no teaching regarding inflammation present in either patent.

Since there no suggestion in either patent concerning treatment of inflammatory symptoms, the combination *cannot* provide the basis for an obviousness rejection. Moreover, even if the combination could provide the basis for an obviousness rejection, there is no suggestion to combine the teachings of these patents found in either patent or any knowledge available to one of ordinary skill in the art. As stated in *Ecolochem, Inc. v. Southern California Edison Co.*, 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000):

Our case law makes clear that the best defense against hindsight-based obviousness analysis is the rigorous application of the requirement for a showing of a teaching or motivation to combine the prior art references...Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability—the essence of hindsight.

(citations omitted.)

Although both patents mention the use of glass, Bonfield et al. uses it to bond to tissue while Shimono et al. merely uses the glass as a vehicle to contain an antibacterial material. In view thereof, there is no suggestion or motivation to combine these patents.

The second requirement for a *prima facie* case of obviousness is a reasonable expectation of success. The cited patents do not provide any information which would enable

one of skill in the art to reasonably expect that the use of bioactive glass as claimed would treat inflammatory conditions. Rather, Bonfield et al. relates to composite materials for the repair of tissues which composite materials bond with the tissues. Shimono et al. relates to the use of glass as *carrier* material for antibacterial ions. "Antibacterial" is defined to mean destructive to or inhibiting the growth of not only bacteria but also mold or other fungi.

*Col. 2, lines 33-35.* Inflammatory symptoms are not mentioned. Thus, one of skill in the art would not have known from these patents that glass *could* be used in an inflammation treating amount to treat inflammation, nor would one of skill in the art been able to discern any expectation of success from these patents.

The third requirement for a *prima facie* of obviousness is that the prior art references must teach or suggest all the claim limitations. Clearly, this requirement has not been met here. Claim 1 is directed to a method for treating inflammatory symptoms related to skin disorders. Neither Bonfield et al. nor Shimono et al. teaches or suggests treating inflammatory symptoms *or* skin disorders. Claim 1 is further directed to topical application of a medicinal composition comprising a non-interlinked, particulate bioactive glass. Neither Bonfield et al. nor Shimono et al. teaches or suggests the topical application of a medicinal composition as claimed. Bonfield et al. does not teach or suggest topical application of any kind and Shimono et al. does not teach or suggest medicinal compositions.

As shown, none of the three basic requirements of a *prima facie* case of obviousness has been made. The cited patents would not have led one of skill in the art to the claimed invention. In view thereof, Applicants respectfully request that the rejection be withdrawn.

Applicants believe they have responded to all matters raised in the above referenced Office Action and that the application is now in condition for allowance. If the Examiner has any questions concerning this Application or this Reply and Amendment, he is invited to contact the undersigned.

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